

New D-D- π -A Triphenylamine-coumarin Sensitizers for Dye Sensitized Solar Cells

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1. Fabrication of dye-sensitized solar cells

The FTO glass was immersed in a detergent solution for 15 min, and then rinsed with water and ethanol. A main transparent layer with titania particles and a scattering layer with titania particles were deposited onto a conducting glass substrate using the screen printing technique, resulting in the TiO₂ electrodes (0.16 cm²). The TiO₂ electrodes were gradually heated under an air flow at 325 °C for 5 min, at 375 °C for 5 min, and at 450 °C for 15 min, and finally, at 500 °C for 15 min. After being cooled to room temperature, TiO₂ electrodes were immersed in a mixture of MeOH and CHCl₃ (V_{MeOH}:V_{CHCl₃}=1:10) solution containing the dye at 0.3 mM for 24 h to assure complete dye uptake. They were then rinsed with MeOH to remove excess dye and dried under a stream of nitrogen. Meanwhile, the counter electrodes were prepared by screen-printing a 50 nm Pt layer on the cleaned FTO plates. Open cells were fabricated in air by clamping different TiO₂ electrodes and platinized counter electrodes filling with the electrolyte. The electrolyte consists of the CH₃CN solution of 0.3 M 1-methyl-3-propylimidazolium iodide (MPII), 0.03 M I₂, 0.07 M LiI, 0.1 M guandine thiocyanate and 0.4 M 4-tert-butylpyridine (TBP).

2. Copies of ^{13}C NMR



